

**To:** [Personal Email/Ex. 6] Way, Steven[way.steven@epa.gov]  
**From:** wsimon@frontier.net  
**Sent:** Mon 8/24/2015 4:37:30 PM  
**Subject:** RE: GK and/or RB Sampling

I'm forwarding this email to the project manager Steve Way so he understands your wishes and reasoning. When do you think we should collect the samples and how do we ship it? I assume we want to collect and ship as soon as you are ready so as to minimize significant changes over time. I will solicit help in getting this done. Bill

**From:** [Personal Email/Ex. 6]  
**Sent:** Saturday, August 22, 2015 9:35 AM  
**To:** wsimon@frontier.net  
**Subject:** Re: GK and/or RB Sampling

Good morning, Bill-

I found USEPA's controlling docs to their contractor's Task Order this am. I noted that they directed ER to use lay flat hose or aluminum piping for water conveyance. For sampling, it will be essential that sample collection equipment and containers be clean stainless steel, glass, or plastic material. The pH of the drainage will degrade other materials and contribute to the metal content in the water, and in particular, aluminum, if from piping or lay flat hose end fittings and valves.

Thanks,

Karl

Sent from my iPhone

On Aug 21, 2015, at 1:22 PM, Karl Yost [Personal Email/Ex. 6] wrote:

This is outstanding! Ideally, I'd like at least two to three (2-3) 5-gallon buckets with locking lids from the drainage from the highest priority portal and/or with worst water quality at this time. Samples will need to be collected upstream from where any reagents or treatment additives are applied, and prior to aeration from flow cascading down through rocky open channels. I'd like to work with both portal drainages, but I'm running on limited funds this early on and time is limited/precious for all. I would work on 200-500ml aliquots at first for initial viability determinations, and if successful/promising, step up to our 4.5-5gal batch lab unit. I'm assuming pH/acidity neutralization is of highest interest, followed by heavy metal removal.

I will also need, at minimum: pH, temp, conductivity, flow, TSS, TDS, dissolved oxygen, ORP, salinity, hardness, sulfate, sulfide, calcium, iron, aluminum, and alkalinity/acidity data from as near as the time of collection as possible, or at least to reflect current seasonal conditions. Heavy metals as totals and dissolved would also be helpful, but with focus on acidity/pH, that data can come later should it not be readily available.

System scale-up to meet GK needs from viability, to 4.5-5 gal batch, to the 15-50 gpm full-scale system we are working on may be difficult. I suppose a split stream in that upper flow range might be feasible to be run as a field demonstration pilot for validation and information/data gathering for full-scale design. I understand I'm way ahead of things, but it doesn't hurt to contemplate future planning.

Another option that might be worth considering after the 5-gallon bucket samples would be to collect a full tote of 200-300 gallons, although timely shipping/handling could be problematic. Regardless, all buckets/containers need be new and rinsed with clean water.

Also note, pH at the time of my Gladstone sampling on 08/14 was 3.19 S.U. at time of sampling, and it increased to the 3.34 when I measured it again here in WA on 08/20.

<275\_gallon\_tote\_large1[1].jpg>

thanks, Bill!

ky

Karl Yost

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*Water Works!*

----- Original Message -----

From: [wsimon@frontier.net](mailto:wsimon@frontier.net)

To: **Personal Email/Ex. 6**

Sent: 8/21/2015 10:44:08 AM

Subject: RE: Cement cr Trtd water

Karl, The EPA has agreed to collect GK water for you. What do you need?

They may approve from R & B too. Bill

-----Original Message-----

From: **Personal Email/Ex. 6**

Sent: Thursday, August 20, 2015 11:09 AM

To: <[wsimon@frontier.net](mailto:wsimon@frontier.net)>

Subject: Cement cr Trtd water

Hi Bill,

Raw Cement Ck water from Gladstone on left at pH ~3.3 as collected. All others at pH >5 to 7.4 without lime or reagent additives via various system configurations. Now to optimize at .2gpm. Focus was only on pH. Not looking at metals in this viability test. More for you in days/weeks ahead. Will test other AMD next.

Thanks for your time the other day,

Karl Yost

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